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09/864,013	05/23/2001	Cheng-Chung Lee	64,600-076	9975

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EXAMINER
PHINNEY, JASON R

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 05/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/864,013	LEE ET AL.
	Examiner	Art Unit
	Jason Phinney	2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-12 and 21-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-12 and 21-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. The Amendment, filed on 3/24/03, has been entered and acknowledged by the Examiner. Cancellation of claims 4 and 13-20 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 3, 5, 7-9, and 12 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by U.S. Patent No. 6,400,091 to Deguchi.

Regarding Claim 1, Deguchi discloses a field emission display panel with a first electrically insulating plate (Figure 3, #41) on which is formed a plurality of emitter stacks positioned parallel to a transverse direction of the insulating plate and each comprising a layer of a first electrically conductive material (#45) on top of which is a layer of nanotube emitters (#14). The width of the nanotube layer is less that ¾ the width of the first electrically conductive material (see Figure 1A, #'s 14 and 12 respectively). Deguchi further discloses that there should be a second electrically insulating plate (Figure 4, #42) placed over and spaced apart from the first electrically insulating plate with a layer of a second electrically conductive material (#46) on

the inside surface. Deguchi further discloses that there should be a multiplicity of strips of fluorescent powder coating on the second electrically conductive material each for emitting a red, green, or blue light upon activation by the electrons emitted from the plurality of emitter stacks (Column 9, Lines 40-49). Finally, Deguchi discloses that there should be a plurality of side panels joining the peripheries of the first and second electrically insulating plates together to form a vacuum tight cavity (Column 9, Lines 1-6).

Regarding Claim 2, Deguchi further exemplifies that the width of the nanotube layer is less that ¾ the width of the first electrically conductive material but more than ¼ the width of the first electrically conductive material (see Figure 1A, #'s 14 and 12 respectively).

Regarding Claim 3, Deguchi further discloses that there should be a black matrix layer in-between the multiplicity of fluorescent strips (Column 9, Lines 45-49).

Regarding Claim 5, Deguchi further discloses that the layer of first electrically conductive material is a cathode (Figure 3, # 45 and Column 8, Lines 49-51).

Regarding Claim 7, Deguchi further discloses that the layer of second electrically conductive material is an anode (Figure 3, # 46 and Column 8, Lines 52-53).

Regarding Claim 8, Deguchi further discloses that the layer of second electrically conductive material is formed of indium-tin-oxide (Column 5, Lines 23-24).

Regarding Claim 9, Deguchi further discloses that the layer of nanotube emitters should be formed of a mixture of nanometer dimensioned hollow tubes and a binder material (Column 6, Lines 44-61).

Regarding Claim 12, Deguchi further discloses that there should be a second layer of the first electrically conductive material (Figure 1A, #15 and Column 5 Lines 14-15 and 52-53

explain that both layers can be of aluminum). The second layer is formed on top of a plurality of rib sections (Figure 1A, #16) and function as a second anode.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,400,091 to Deguchi in view of U.S. Patent No. 6,414,433 to Moore.

Deguchi discloses the field emission display panel of Claim 1 as described above.

Deguchi fails to exemplify that the layer of a first electrically conductive material should be a silver paste.

Moore, in an alternate display panel, teaches that the layer of a first electrically conductive material should be a silver paste (Column 1, Lines 64-66) because it can be easily printed and formed in various patterns, thereby facilitating production.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the display panel of Deguchi with the silver paste of Moore in order to facilitate the production of the display panel.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,400,091 to Deguchi in view of U.S. Patent No. 6,057,637 to Zettl.

Deguchi discloses the field emission display panel of Claim 1 as described above.

Deguchi fails to exemplify that the layer of nanotube emitters should be formed of a mixture of nanometer dimensioned tubes of carbon, diamond, or diamond-like carbon and a polymeric-based binder.

Zettl, in the similar field of field emission electron sources, teaches that the layer of nanotube emitters should be formed of a mixture of nanometer dimensioned tubes of carbon, diamond, or diamond-like carbon and a polymeric-based binder (Column 3, Lines 1-5) in order to retain the nanotubes in the desired location.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the display panel of Deguchi with the polymeric-based binder of Zettl in order to retain the nanotubes.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,400,091 to Deguchi in view of U.S. Patent No. 5,939,823 to Kiyomiya.

Deguchi discloses the field emission display panel of Claim 1 as described above.

Deguchi fails to exemplify that each of the multiplicity of stripes of fluorescent powder coating should emit a light of red, green, or blue that is different than the light emitted by its immediate adjacent strips when activated by electrons from the plurality of emitter stacks.

Kiyomiya, in an alternate display, teaches that each of the multiplicity of stripes of fluorescent powder coating should emit a light of red, green, or blue that is different than the

light emitted by its immediate adjacent strips when activated by electrons from the plurality of emitter stacks (Figure 1, #'s 1R, 1G, and 1B correspond to Red, Green, and Blue fluorescent strips). The fluorescent strips are arranged in this manner in order to provide all three colors for any given pixel on the screen.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the display panel of Deguchi with the location of the fluorescent strips of Kiyomiya in order to produce a display where each of the three colors of light is capable of being emitted from each pixel.

7. Claims 21-24, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,400,091 to Deguchi in view of U.S. Patent No. 6,407,502 to Hidler.

Regarding Claim 21, Deguchi discloses a field emission display panel with a first electrically insulating plate (Figure 3, #41) on which is formed a plurality of emitter stacks positioned parallel to a transverse direction of the insulating plate and each comprising a layer of a first electrically conductive material (#45) on top of which is a layer of nanotube emitters (#14). The width of the nanotube layer is less that ¾ the width of the first electrically conductive material (see Figure 1A, #'s 14 and 12 respectively). Deguchi further discloses that there should be a second electrically insulating plate (Figure 4, #42) placed over and spaced apart from the first electrically insulating plate with a layer of a second electrically conductive material (#46) on the inside surface. Deguchi further discloses that there should be a multiplicity of strips of fluorescent powder coating on the second electrically conductive material each for emitting a red, green, or blue light upon activation by the electrons emitted from the plurality of emitter

stacks (Column 9, Lines 40-49). Finally, Deguchi discloses that there should be a plurality of side panels joining the peripheries of the first and second electrically insulating plates together to form a vacuum tight cavity (Column 9, Lines 1-6). Deguchi fails to exemplify that the first and second electrically insulating plates should be formed of a ceramic material that is substantially transparent.

Regarding Claim 22, Deguchi further exemplifies that the width of the nanotube layer is less that ¾ the width of the first electrically conductive material but more than ¼ the width of the first electrically conductive material (see Figure 1A, #'s 14 and 12 respectively).

Regarding Claim 23, Deguchi further discloses that there should be a black matrix layer in-between the multiplicity of fluorescent strips (Column 9, Lines 45-49).

Regarding Claim 24, Deguchi further discloses that the layer of first electrically conductive material is a cathode (Figure 3, # 45 and Column 8, Lines 49-51).

Regarding Claim 26, Deguchi further discloses that the layer of nanotube emitters should be formed of a mixture of nanometer dimensioned hollow tubes and a binder material (Column 6, Lines 44-61).

Regarding Claim 28, Deguchi further discloses that there should be a second layer of the first electrically conductive material (Figure 1A, #15 and Column 5 Lines 14-15 and 52-53 explain that both layers can be of aluminum). The second layer is formed on top of a plurality of rib sections (Figure 1A, #16) and function as a second anode.

Hidler teaches that the insulating plates should be formed of a ceramic material that is substantially transparent (Column 2, Lines 53-55) in order to increase the brightness of the display panel.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the display panel of Deguchi with the substrate of Hidler in order to increase the brightness of the display panel.

8. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,400,091 to Deguchi in view of U.S. Patent No. 6,407,502 to Hidler and further in view of U.S. Patent No. 6,414,433 to Moore.

Deguchi in view of Hidler teaches the field emission display panel of Claim 21 as described above.

Deguchi in view of Hidler fails to exemplify that the layer of a first electrically conductive material should be a silver paste.

Moore, in an alternate display panel, teaches that the layer of a first electrically conductive material should be a silver paste (Column 1, Lines 64-66) because it can be easily printed and formed in various patterns, thereby facilitating production.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the display panel of Deguchi in view of Hidler with the silver paste of Moore in order to facilitate the production of the display panel.

9. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,400,091 to Deguchi in view of U.S. Patent No. 6,407,502 to Hidler and further in view of U.S. Patent No. 6,057,637 to Zettl.

Deguchi in view of Hidler teaches the field emission display panel of Claim 21 as described above.

Deguchi in view of Hidler fails to exemplify that the layer of nanotube emitters should be formed of a mixture of nanometer dimensioned tubes of carbon, diamond, or diamond-like carbon and a polymeric-based binder.

Zettl, in the similar field of field emission electron sources, teaches that the layer of nanotube emitters should be formed of a mixture of nanometer dimensioned tubes of carbon, diamond, or diamond-like carbon and a polymeric-based binder (Column 3, Lines 1-5) in order to retain the nanotubes in the desired location.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the display panel of Deguchi in view of Hidler with the polymeric-based binder of Zettl in order to retain the nanotubes.

Response to Arguments

10. Applicant's arguments filed 3/24/03 have been fully considered but they are not persuasive.

11. In response to the Applicant's contention that Figure 1A of Deguchi shows the electron emission member on top of the cathode for illustration purposes only the Examiner respectfully disagrees. Figures 2 and 3 clearly shows that the structure of Figure 1A is preferable in order to emit electrons toward the phosphor layer applied on the underside of the anode (shown in figure 3).

12. In response to the Applicant's contention that the disclosure of Deguchi at Column 6, Line 13 teaches away from the Applicant's invention, the Examiner respectfully disagrees. Column 6, Line 13 teaches that when a thin film of diamond is used for the electron emission member it may be made of any shape at any location, this is an alternate example to that of the nanotube emitter and as such is not relevant to the issue at hand, however, this teaching that any shape will work for the diamond emitter would also encompass the range claimed of the second width less than ¾ of the first width and certainly does not teach away from the limitation as the Applicant asserts. Figure 1A clearly shows the emitter layer to be less than ¾ of the width of the cathode in order to maximize the amount of electrons emitted at a particular array location without unnecessarily wasting additional electrons by emitting them from an area larger than the aperture in the control electrode.

13. In response to applicant's argument that U.S. Patent No. 6,407,502 to Hidler is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. In this case, both Hidler and Deguchi teach display panels. Deguchi teaches that glass, quartz, or silicon may be used as substrates due to their transparency and non-conductive properties; this list was intended to be exemplary and not all-inclusive. Hidler teaches that ceramic materials are capable of substituting for silicon and glass substrates in display panels because they can also be made transparent and non-conductive.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Phinney whose telephone number is (703) 305-3999. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JP
May 22, 2003

VIP PATEL
PRIMARY EXAMINER